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09/977,666	10/15/2001	J. Yong Ryu	CDT 1792	3465
1338	7590	05/04/2004	EXAMINER	
KENNETH H. JOHNSON P.O. BOX 630708 HOUSTON, TX 772630000			NGUYEN, CAM N	
			ART UNIT	PAPER NUMBER
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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Paper No. 05/03/04

Application Number: 09/977,666  
Filing Date: October 15, 2001  
Appellant(s): RYU, J. YONG

**MAILED**  
**MAY 04 2004**  
**GROUP 1700**

Kenneth H. Johnson  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed February 05, 2004.

**(1) *Real Party in Interest***

A statement identifying the real party in interest is contained in the brief.

**(2) *Related Appeals and Interferences***

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

**(3) *Status of Claims***

The statement of the status of the claims contained in the brief is correct.

This appeal involves claims 1-12.

Claims 13-20 are withdrawn due to nonelected (distinct) invention.

**(4) *Status of Amendments After Final***

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) *Summary of Invention***

The summary of invention contained in the brief is correct.

**(6) *Issues***

The appellant's statement of the issues in the brief is correct.

**(7) Grouping of Claims**

Appellant's brief includes a statement that all claims are grouped together.

**(8) Claims Appealed**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(9) Prior Art of Record**

The following is a listing of the prior art of record relied upon in the rejections of claims under appeal.

Frenzel et al.	02-2002	US 6,350,717 B1
Brown et al.	10-2000	US 6,127,310

**(10) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

A. Claims 1-7 & 9-12 are rejected under 35 U.S.C. 102(e) as being anticipated by Frenzel et al. "hereinafter Frenzel", (US Pat. 6,350,717 B1). This rejection is set forth in prior Office Action, Paper No./Mail Date 9/25/03.

Frenzel discloses a catalyst for selective hydrogenation of unsaturated compounds in hydrocarbon streams comprising at least one metal of the 10th group of the Periodic Table of the Elements and at least one metal of the 11th group of the Periodic Table of the Elements on an aluminum oxide support (see col. 11, claim 1). The 10th group consists of the elements of nickel, palladium, and platinum; and the 11th

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group consists of the elements of copper, silver, and gold (see col. 5, ln 20-23). The content of metal or metals of the 10th group of the Periodic Table of the Elements in the catalyst is at least 0.005% by weight, based on its total mass (see col. 6, ln 3-7). The content of metal or metals of the 11th group of the Periodic Table of the Elements in the catalyst is not more than 3.9% by weight, based on its total mass, (see col. 6, ln 15-24). Specifically, the metal or metals of the 10th group is or are present in an amount of at least 0.005% by weight and at most 2% by weight, based on the total weight of the catalyst (see col. 12, claim 2). The catalyst comprising palladium as metal of the 10th group (see col. 12, claim 3). The catalyst comprising silver as metal of the 11th group (see col. 12, claim 4). The catalyst further comprise other elements other than the metals of the 10th and 11th groups of the Periodic Table of the Elements in its active composition, in particular, it may comprise promoters, such as the alkali metals and alkaline earth metals, e.g., lithium, sodium, potassium, rubidium, cesium, magnesium, calcium, strontium, and/or barium, and elements of the 3rd group, e.g., gallium and/or indium, or other promoters such as zinc or fluoride (see col. 6, ln 23-33). The type and amount of such promoters need to be optimized in a customary manner for the individual case; in general, the amounts of such promoters added are in the range from a few ppm by weight to a few thousand ppm by weight (see col. 6, ln 33-37). The catalyst support consists of only aluminum oxide, which is made of the known aluminum oxide phases or the known partially hydrated aluminum oxide phases, for example,  $\alpha$ -,  $\beta$ -,  $\gamma$ -,  $\delta$ -,  $\theta$ - or  $\chi$ -aluminum oxide, boehmite, pseudoboehmite or a mixture thereof (see col. 4, ln 38-44). The support having a BET surface area of from 2 to 200 m<sup>2</sup>/g, the total

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pore volume is at least 0.1 ml/g and at most 1.0 ml/g, and the mean pore diameter is at least 50 nanometers (50nm= 500A) and at most 150 nanometers (150nm=1500A) (see col. 4, ln 44-62).

Regarding claims 1-3, Frenzel discloses the same catalyst containing the same metals, thus meets the claims.

Regarding claims 4 & 6, the claims are met by the reference since Frenzel teaches Zn and K are suitable promoters can be added to the catalyst (see Frenzel at col. 6, ln 23-33).

Regarding claim 5, the claimed support properties: average pore diameter & total pore volume are met by the reference since they fall within the disclosed ranges (Frenzel at col. 4, ln 44-62).

Regarding claim 7, minimum requirement of the claim is a catalyst containing Pd in the range of 0.005 to 1% by weight and Ag in the range of 0.002 to 20% by weight because the minimum amounts required for Ni, Zn, and Bi are "0" amounts. The claimed Pd and Ag metal contents are met by the teaching of the reference since they fall within the disclosed ranges (see Frenzel at col. 6, ln 3-7, col. 6, ln 15-24, & col. 6, ln 33-37).

Regarding claims 5 & 10-11, the claimed BET surface area of the support is met by the teaching of the reference since they fall within the disclosed BET surface area (see Frenzel at col. 4, ln 44-62).

Regarding claim 9, it is considered the claimed K amount is met by the teaching of the reference in view of the teaching in Frenzel, that the promoter amount can be

ranging from a few ppm by weight to a few thousand ppm by weight (see Frenzel at col. 6, ln 33-37).

Regarding claim 12, Frenzel is silent with respect to the apparent bulk density of the alumina support. However, it is inherent that the same alumina support possesses the same bulk density since both applicants' and Frenzel's alumina support having a mixed crystalline form as specified in the claim.

B. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Frenzel et al., "hereinafter Frenzel", (US Pat. 6,350,717 B1), as applied to claims 1-7 & 9-12 above, and further in view of Brown et al., "hereinafter Brown", (US Pat. 6,127,310). This rejection is set forth in prior Office Action, Paper No./Mail Date 9/25/03.

Frenzel discloses a catalyst for selective hydrogenation of unsaturated compounds in hydrocarbon streams as described above, except for bismuth.

However, it would have been *prima facie obvious* to one of ordinary skill in the art at the time the invention was made to have incorporated bismuth into the catalyst of Frenzel to obtain an improved catalyst having enhanced selectivity because Brown fairly teaches that bismuth is a useful selectivity enhancer for selective hydrogenation catalyst (see Brown at col. 3, ln 48-55), and the selectivity enhancer can be present in the composition in the range of from about 0.0003 to about 20 (see Brown at col. 4, ln 26-30).

The claimed bismuth amount is met by the teaching of the reference since it falls within the disclosed range (see Brown at col. 4, ln 26-30).

The claimed zinc amount is met by the teaching of the reference since it falls within the disclosed range in view of the teaching, that the promoter amount can be ranging from a few ppm by weight to a few thousand ppm by weight (see Frenzel at col. 6, ln 33-37).

**(11) Response to Argument**

Applicants urged, that "the term "at least one" is not a disclosure of more than one, it merely does not preclude another metal from the group in question... Frenzel requires only at least one New Group 10 metal (Ni, Pd, Pt) and one New Group 11 metal (Cu, Ag, Au). The required metals of Frenzel do not include either Zn or Bi (at least one of must be present in addition to Ag for the present invention), thus the compositions as disclosed by Frenzel cannot be the same as the present invention" (page 5, first paragraph of the Brief). This is noted, but not found persuasive for the following reasons.

It is considered the claims are anticipated by the Frenzel reference in view of In re Schauman, 572 F.2d 312, 197 USPQ 5 (CCPA 1978). Frenzel specifically teaches a catalyst comprising at least one metal of the 10<sup>th</sup> group of the Periodic Table of the Elements and at least one metal of the 11<sup>th</sup> group of the Periodic Table of the Elements on an aluminum oxide support (see Frenzel at col. 11- col. 12, claim 1). Frenzel discloses that the 10<sup>th</sup> group consists of the elements Ni, Pd, and Pt; and the 11<sup>th</sup> group consists of the elements copper, silver, and gold (see col. 5, ln 20-22). Frenzel also discloses that the catalyst can further comprise additional additives and/or promoters,



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such as alkali metals and alkaline earth metals, elements of the 3<sup>rd</sup> group, e.g., gallium and/or indium, or other promoters, such as zinc or fluoride (see col. 6, ln 23-33). It is clear from the reference that Pd (metal of the 10<sup>th</sup> group) and Ag (metal of the 11<sup>th</sup> group) are required (see Frenzel at col. 12, claims 3 & 4). Since the 10<sup>th</sup> group metals consists only three metals (Pd, Ni, and Pt), and Frenzel teaches that the catalyst comprises at least one metal of the 10<sup>th</sup> group meaning that in addition to the Pd, another metal or metals can be chosen from the three listed metals. A group containing three metals is not a large group, and that the term "at least one" disclosed by Frenzel meaning "more than one metal" can be chosen from such small group.

In response to applicants' argument regarding "Zn", since Frenzel teaches "Zn" is a suitable catalyst promoter, one having the ordinary skill in the art at the time the invention was made would have inherently added such Zn promoter to the catalyst of Frenzel because the reference fairly suggests that it is suitable (see Frenzel at col. 6, ln 23-33). While zinc is not required in Frenzel, but there is a suggestion in the reference that it can be used as a promoter for the catalyst. And when "Zn" is added to the catalyst, the resultant catalyst is the same or has the same metal components as the claimed catalyst.

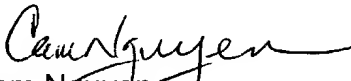
Regarding applicants' arguments on claims 8 and 12, they will not be addressed since applicants stated that "all of the claims are grouped together".

It is the Examiner's position to conclude that the rejections are proper. Claims 1-7 & 9-12 are still applicable under a 102(e) because it is anticipated by a single reference. Claim 8 also remains rejected for the reason as discussed above.

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For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,


  
Cam Nguyen


Primary Examiner  
AU-1754

Nguyen/cnn  
May 3, 2004

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